

LONDON- WEST MIDLANDS ENVIRONMENTAL STATEMENT

Volume 5 | Technical Appendices

CFA12 | Waddesdon and Quainton

Data appendix (AQ-001-012)

Air quality

November 2013

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Department
for Transport

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Contents

1	Introduction	1
2	Policy framework	2
3	Baseline air quality data	3
3.1	Existing air quality	3
3.2	Receptors	4
4	Dust impact evaluation and risk rating	6
5	Air quality assessment - road traffic	10
5.1	Overall assessment approach	10
5.2	Model inputs and verification	11
5.3	Construction traffic model	11
5.4	Operational traffic model	17
6	References	21

List of tables

Table 1:	Annual mean NO ₂ concentration recorded at diffusion tube monitoring sites	4
Table 2:	Evaluation and risk rating of construction activities	6
Table 3:	Summary of construction dust impacts and effects	9
Table 4:	Modelled receptors (construction phase)	12
Table 5:	Background 2017 concentrations at assessed receptors	12
Table 6:	Summary of DMRB annual mean NO ₂ results (construction phase)	13
Table 7:	Summary of DMRB annual mean PM ₁₀ results (construction phase)	13
Table 8:	Critical level assessment for the protection of vegetation	14
Table 10:	Critical level assessment for the protection of vegetation	15
Table 11:	Critical load - nutrient nitrogen deposition	16
Table 12:	Modelled receptors (operational phase)	18
Table 13:	Background 2026 concentrations at assessed receptors	18
Table 14:	Summary of DMRB annual mean NO ₂ results (operational phase)	19
Table 15:	Summary of DMRB annual mean PM ₁₀ results (operational phase)	19

1 Introduction

1.1.1 The air quality appendices for the Waddesdon and Quainton community forum area (CFA12) comprise:

- discussion of the policy framework (Section 2);
- baseline air quality data (Section 3);
- dust impact evaluation and risk rating (Section 4); and
- air quality assessment - road traffic (Section 5).

1.1.2 Maps referred to throughout the air quality appendix are contained in the Volume 5, Air Quality Map Book.

2 Policy framework

- 2.1.1 The Aylesbury Vale District Local Plan¹ does not contain any policies specific to air quality but contains overarching policies for the protection of public amenity. Saved Policy GB.8 seeks to prevent development that will unreasonably harm any aspect of the amenity of nearby residents whilst Saved Policy GP.95 seeks to protect the amenities of existing occupiers.

¹ Aylesbury Vale District Council (2004) *Aylesbury Vale Local Plan 2004*.

3 Baseline air quality data

3.1 Existing air quality

Local authority review and assessment information

- 3.1.1 Aylesbury Vale District Council carries out monitoring across its district. As part of its review and assessment process, the Council has identified a number of areas that may not be compliant with air quality standards. Following detailed assessments, an air quality management area (AQMA) was formally declared along the A41 Ring Road in July 2005, and two AQMAs were declared along Stoke Road and Friarage Road in 2007 in respect of the annual mean nitrogen dioxide (NO₂) standard. All three of these areas lie outside the study area.
- 3.1.2 In its 2010 progress report, the Council identified two further areas in Aylesbury and Buckingham Town Centre where concentrations of NO₂ were close to or exceeding air quality standards². These areas will not be affected by the Proposed Scheme.
- 3.1.3 From local authority information, baseline concentrations of NO₂ and particulate matter as PM₁₀ and PM_{2.5} in the study area are well within air quality standards which are as follows:
- 40µg/m³ as an annual mean for NO₂ and PM₁₀;
 - 200µg/m³ one-hour mean for NO₂ not to be exceeded more than 18 times a year (equivalent to the 99.8th percentile of the one-hour mean);
 - 50µg/m³ 24-hour mean for PM₁₀ not to be exceeded more than 35 times a year (equivalent to the 90.4th percentile of the 24-hour mean); and
 - 25µg/m³ as an annual mean for PM_{2.5}.

Local air quality monitoring data

Continuous monitoring

- 3.1.4 There are no continuous monitors within the study area that are relevant to this assessment.

Diffusion tubes

- 3.1.5 This section summarises the results from the diffusion tube sites that are considered relevant for the assessment of air quality in this study area³.

² Aylesbury District Council (2010) *Air Quality Progress Report* 2010.

³ Aylesbury District Council; Aylesbury Vale 6 year diffusion tube data; <https://www.aylesburyvaledc.gov.uk/environment/air-quality/monitoring>; Accessed: July 2013.

Table 1: Annual mean NO₂ concentration recorded at diffusion tube monitoring sites

Site	Ordnance Survey coordinates	Annual mean NO ₂ concentrations (µg/m ³)				
		2008	2009	2010	2011	2012
High Street Waddesdon	474401, 216938	N/A	N/A	30	24	N/A

Background pollutant concentrations

- 3.1.6 Estimates of background air quality have been taken from Department for Environment, Food and Rural Affairs (Defra) maps⁴. Background NO₂ concentrations are within air quality standards throughout the study area, with annual mean concentrations in the range 9.0µg/m³ - 10.4µg/m³ in 2012. Background PM₁₀ concentrations are within air quality standards throughout the study area, with annual mean concentrations in the range 14.4µg/m³ - 15.8µg/m³ in 2012.

Local emission sources

- 3.1.7 The main source of pollution in the study area is road vehicles, with little industry and some emissions from residential areas. The only major road is the A41.

3.2 Receptors

Human

Construction phase

- 3.2.1 Potential receptors are primarily those residential properties close to close to construction activity and alongside roads where traffic flows will change as a consequence of construction activity. Notable receptors in relation to construction activities include properties at Wayside Farm, Crossroads Farm, Upper South Farm, and Woodlands Farm, Woodlands Farm Cottages and properties on Quainton Road. Notable receptors near roads where traffic flows will increase are The Georgian Dolls House, Pear Tree Cottage, Winding Brook and Perry Hill Cottage. Receptors at greatest risk of dust effects are indicated in Maps AQ-02-012-01 and AQ-02-012-02 (Volume 5, Air Quality Map Book).

Operational phase

- 3.2.2 Once the Proposed Scheme is operational, only receptors located on roads where possible increases in operational traffic will occur or where road alignment will change by greater than 5m have the potential to be affected. Notable receptors in the latter category include 145 Station Road, Wayside Farm and Woodlands Farm Cottages.

⁴ Department for Environment, Food and Rural Affairs (Defra) (2012) *Defra Background Pollutant Concentration Maps*; <http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html>; Accessed: July 2013

Ecological

Construction phase

- 3.2.3 Sheephouse Wood Site of Special Scientific Interest (SSSI) has been considered for the construction dust assessment, along with Finemere Wood SSSI. A further two SSSIs have been identified for the construction traffic assessment: Ham Home-cum-Hamgreen Woods and Long Herdon Meadow. Further details on these ecological receptors can be found in Volume 5: Appendix EC-012-252.

Operational phase

- 3.2.4 No ecological receptors in the study area are predicted to be affected by air quality as a result of the operational phase.

4 Dust impact evaluation and risk rating

- 4.1.1 The following sections provide details of the assessment of construction impacts following the Institute of Air Quality Management (IAQM) guidance⁵. Where considered useful to identify receptors and their relationship to the construction activity, a specific figure is provided. On-site haul movements were assessed explicitly.
- 4.1.2 The dust assessment criteria for the haul route are based on those for earthworks, as set out in the IAQM guidance. This emission phase was considered to be the most applicable, as the assessment of impacts from earthworks will depend, in part, on the passage of vehicles over open surfaces. It was assumed that significant effects would not occur beyond a distance of 50m from the haul route, again based on interpretation of the earthworks criteria, and that all areas of the haul route will be subject to more than 10 vehicle movements per day. On the basis of criteria for earthworks within the IAQM guidance, the dust emission class for the haul route is large. Wherever there are receptors within 50m of a haul route, the sensitivity of the receiving environment was derived using the IAQM guidance. The need for, and capability of, the local environmental management plan (LEMP) to control these dust emissions, as directed by the draft Code of Construction Practice⁶ (CoCP), was then considered in forming the conclusion of the assessment.

Table 2: Evaluation and risk rating of construction activities

Activity	Distance to nearest receptor	Dust emission class	Dust risk category	Sensitivity of surrounding area	Magnitude of impact (with draft CoCP mitigation measures)	Principal justifications
Cuttings and embankments - Wayside Farm, Quainton Road, Cross Roads Farm, Upper South Farm, Woodlands Farm Cottages and Woodlands Farm (Map AQ-02-012-01, Figures 12.1-12.4, and Map AQ-02-012-02, Figures 12.5 and 12.6 (Volume 5, Air Quality Map Book))						
Demolition	100-200m	Small	Low	Low	Negligible	1. Total building volume less than 20,000m ³ . 2. No receptors within 20m of the site.
Earthworks	Less than 20m	Large	High	Medium	Negligible	1. Total site area greater than 10,000m ² . 2. Fewer than 10 receptors within 20m of

⁵ Institute of Air Quality Management (IAQM), (2011), *Guidance on the assessment of the impacts of construction on air quality and the determination of their significance*

⁶ Volume 5: Appendix CT-003-000

Activity	Distance to nearest receptor	Dust emission class	Dust risk category	Sensitivity of surrounding area	Magnitude of impact (with draft CoCP mitigation measures)	Principal justifications
						the site.
Construction	20-50m	Large	High	Low	Negligible	1. Use of dusty construction materials. 2. No receptors within 20m of the site.
Trackout	Less than 20m	Medium	Medium	Medium	Negligible	1. Less than 100 heavy goods vehicles (HGVs) on road. 2. Fewer than 10 receptors within 20m of roadside.
Haul route	Less than 50m	Large	High	Medium	Negligible	1. More than 10 heavy good vehicle (HGV) movements per day. 2. Fewer than 10 receptors within 50m of haul route.
Cuttings and embankments - Sheephouse Wood SSSI (Map AQ-02-012-02, Figure 12.7 (Volume 5, Air Quality Map Book)) and Finemere Wood SSSI						
Demolition	N/A	N/A	N/A	N/A	N/A	No demolition required.
Earthworks	Less than 20m	Large	Medium	High	Negligible	1. Total site area greater than 10,000m ² . 2. Sheephouse Wood SSSI is less than 20m from the site.
Construction	Less than 20m	Large	Medium	High	Negligible	1. Use of dusty construction materials. 2. Sheephouse Wood SSSI is less than 20m from the site.

Appendix AQ-001-012

Activity	Distance to nearest receptor	Dust emission class	Dust risk category	Sensitivity of surrounding area	Magnitude of impact (with draft CoCP mitigation measures)	Principal justifications
Trackout	N/A	N/A	N/A	N/A	N/A	No trackout within 100m of the site.
Haul route	Less than 50m	Large	Medium	High	Negligible	1. More than 10 HGV movements per day. 2. Sheephouse Wood SSSI is within 50m of haul route. Finemere Wood SSSI is more than 50m from the haul route.

Table 3: Summary of construction dust impacts and effects

Location	Magnitude of impact	Effect of dust-generating activities	Additional mitigation
Cuttings and embankments (human)	Negligible	Not significant	None required
Cuttings and embankments (ecological)	Negligible	Not significant	None required

5 Air quality assessment - road traffic

5.1 Overall assessment approach

- 5.1.1 The air quality assessment for road related emissions has considered the use of different approaches based on the scale of changes in traffic and road alignment. Where the Design Manual for Roads and Bridges⁷ (DMRB) thresholds detailed in the Scope and Methodology Report SMR (Volume 5: Appendix CT-001-000/1) are not exceeded, no additional assessment is required as the air quality impacts will be minimal. If these thresholds are breached, then a quantitative assessment has been carried out.
- 5.1.2 Where the road configuration is straightforward, the DMRB screening method has been used to predict changes in air quality. Where the road layout is considered to be complex or where the use of the DMRB screening method has indicated that there will be a potential exceedance of air quality standards, the atmospheric dispersion model ADMS-Roads has been used for the assessment. Professional judgment has been used to select the appropriate tool for each area.
- 5.1.3 In this study area both the DMRB screening method and the ADMS-roads model have been used for the assessment.
- 5.1.4 An assessment of nutrient nitrogen deposition and NO_x concentrations was also undertaken at the Ham Home-cum-Hamgreen Woods and Long Herdon Meadow SSSI because of their proximity to the A41 (west of Blackgrove Road) where changes in construction traffic were found to meet the DMRB criteria for further assessment. Values for the critical level and critical load, and baseline nitrogen deposition rates for the main habitats within the SSSI were taken from the Air Pollution Information System website⁸.
- 5.1.5 Predicted NO_x concentrations as a result of vehicle emissions were used to quantify nutrient nitrogen deposition in terms of in kilograms of nitrogen per hectare per year (kg N/ha/year). Nitrogen deposition can lead to soil eutrophication and impacts on ecosystem biodiversity.
- 5.1.6 The main habitat for the Ham Home-cum-Hamgreen Woods is unmanaged broadleaved and coniferous woodland, with an empirical critical load of 5 - 15 kg N/ha/year and an average baseline deposition rate of 43.4 kg N/ha/year in 2011. The existing nitrogen deposition rate currently exceeds the upper end of the critical load range.
- 5.1.7 The main habitat for Long Herdon Meadow is long and medium altitude hay meadows and calcareous grassland, with an empirical critical load of 20 - 30 kg N/ha/year and an average deposition of 23.4 kg N/ha/year in 2011. It can be observed that the existing nitrogen deposition rate is already exceeding the lower end of the critical load range.

⁷ Highways Agency, (2007), *The Design Manual for Roads and Bridges (Volume 11, Section 3, Part 1 Air Quality HA207/07)*

⁸ Air Pollution Information System; Site relevant critical loads and source attribution; <http://www.apis.ac.uk/src/>; Accessed August 2013.

5.1.8 Future deposition rates for these habitats were calculated following the DMRB methodology. The predicted nitrogen deposition rate and NO_x concentrations were calculated for the future construction year (2017) with and without the Proposed Scheme. The predicted contribution of the traffic to nitrogen deposition rate was compared to 1% of the critical load, as an initial test of insignificance following the guidance used by the Environment Agency and Natural England for assessing the impacts of installations under the Environmental Permitting Regulations. The total deposition rate (made of the additional contribution and the background) was also compared to 70% of the critical load. This additional assessment criterion determines potential significance in cases where the additional contribution is greater than 1% of the relevant criterion. If the total is less than 70% of the criterion, even though the additional contribution is greater than 1%, then the overall effect is not significant. This approach follows that used by the Environment Agency and Natural England when assessing the impacts of installations under the Environmental Permitting Regulations.

5.1.9 Where the DMRB assessment did not rule out significant effects, nitrogen deposition rates and NO_x concentrations were calculated with ADMS-Roads.

5.2 Model inputs and verification

Model parameters for detailed assessment

5.2.1 ADMS-Roads was used for the detailed assessment. A surface roughness length of 0.25m, meteorological site surface roughness length of 0.2m, minimum Monin Obukhov length of 30m and latitude of 52 degrees were used in the detailed assessment. All other parameters were model default settings. Meteorological data from the London Heathrow monitoring site was used.

Model verification

5.2.2 There were no monitoring sites nearby that allowed model verification. Therefore the model was not verified.

5.3 Construction traffic model

5.3.1 Construction traffic information on which this assessment is based is detailed in Volume 5: Appendix TR-001-000. Scenarios assessed were based on maximum traffic on affected roads during the construction phase of the Proposed Scheme.

Receptors assessed

- 5.3.2 For all road links where DMRB criteria for local air quality were met due to increased traffic flows, a number of receptors representative of worst-case exposure locations were selected for assessment. These included locations representative of highest pollutant concentrations along the roads, including closest to junctions or to the road itself.
- 5.3.3 All receptors where DMRB screening identified a likely moderate adverse or significant adverse impact were also modelled within ADMS-Roads. Additional receptors close to DMRB receptors were added in order to ensure that worst-case exposure locations were captured.
- 5.3.4 Receptors assessed are presented in Table 4 and in Map AQ-01-012 (Volume 5, Air Quality Map Book).

Table 4: Modelled receptors (construction phase)

Receptor	Description/Location	Ordnance Survey coordinates
12-1	The Georgian Dolls House (A41 (west of Blackgrove Road))	474776, 216892
12-2	Pear Tree Cottage (Grendon Road/Buckingham Road)	467862, 222237
12-3	Winding Brook (The Broadway)	467268, 220109
12-4	Perry Hill Cottage (Perry Hill (south of School Hill))	468097, 222915
12-5	Ham Home-cum-Hamgreen Woods SSSI (A41 (west of Blackgrove Road))	469652, 218611
12-6	Long Herdon Meadow SSSI (A41 (west of Blackgrove Road))	464795, 220020

Background concentrations

- 5.3.5 The background concentrations used in the assessment are shown in Table 5, taken from the Defra maps.

Table 5: Background 2017 concentrations at assessed receptors

Receptor (or zone of receptors)	Concentrations ($\mu\text{g}/\text{m}^3$)		
	NO _x	NO ₂	PM ₁₀
12-1 The Georgian Dolls House	11.9	8.5	14.3
12-2 Pear Tree Cottage	10.7	7.8	13.9
12-3 Winding Brook	11.0	8.0	14.3
12-4 Perry Hill Cottage	10.9	7.9	13.9
12-5 Ham Home-cum-Hamgreen Woods SSSI	12.0	N/A	N/A
12-6 Long Herdon Meadow SSSI	11.3	N/A	N/A

Design Manual for Roads and Bridges model results

- 5.3.6 This section provides the summary of the modelled pollutant concentrations for the assessed receptors using the DMRB methodology. The magnitude of change and impact descriptor for the four human receptors identified are derived following the Environmental Protection UK (EPUK) methodology⁹. The criteria used to define significance at the ecological sites identified are in line with guidance set out in the Environment Agency H1 guidance document¹⁰, which in turn refers back to joint Environment Agency/Natural England guidance.

Table 6: Summary of DMRB annual mean NO₂ results (construction phase)

Receptor	Concentrations (µg/m ³)			Change in concentrations (µg/m ³)	Magnitude of change	Impact descriptor
	2012 baseline	2017 without Proposed Scheme	2017 with Proposed Scheme			
12-1	17.8	16.6	22.5	5.9	Large increase	Slight adverse
12-2	10.3	8.9	12.1	3.2	Medium increase	Negligible
12-3	10.6	9.1	12.1	3.0	Medium increase	Negligible
12-4	10.7	9.2	12.5	3.2	Medium increase	Negligible

Table 7: Summary of DMRB annual mean PM₁₀ results (construction phase)

Receptor	Concentrations (µg/m ³)			Change in concentrations (µg/m ³)	Magnitude of change	Impact descriptor
	2012 baseline	2017 without Proposed Scheme	2017 with Proposed Scheme			
12-1	1.3	1.3	1.9	0.5	Small increase	Negligible
12-2	0.2	0.2	0.5	0.3	Imperceptible increase	Negligible
12-3	0.2	0.2	0.5	0.3	Imperceptible increase	Negligible

⁹ Environmental Protection UK (EPUK), (2010), *Development Control: Planning for Air Quality*

¹⁰ Environment Agency, (2011), *H1 Annex F Air Emissions V2.2*

Receptor	Concentrations ($\mu\text{g}/\text{m}^3$)			Change in concentrations ($\mu\text{g}/\text{m}^3$)	Magnitude of change	Impact descriptor
	2012 baseline	2017 without Proposed Scheme	2017 with Proposed Scheme			
12-4	14.8	14.1	14.4	0.3	Imperceptible increase	Negligible

Table 8: Critical level assessment for the protection of vegetation

Receptor	NOx concentrations ($\mu\text{g}/\text{m}^3$)							
	2012 baseline	2017 without Proposed Scheme	2017 with Proposed Scheme	Change in concentrations ($\mu\text{g}/\text{m}^3$)	Critical level (annual mean)	Change in concentrations as % of critical level	Total NOx as a % of critical level	Potentially significant? ¹¹
12-5	33.1	27.4	39.3	11.9	30	39.7	131	Yes
12-6	14.5	11.8	12.2	0.4	30	1.3	40.5	No

¹¹ Change in NOx concentration greater than 1% of critical level and total NOx concentration greater than 70% of critical level.

Detailed modelling results

5.3.7 This section provides the summary of the modelled pollutant concentrations for the assessed receptors using ADMS-roads. The magnitude of change and impact descriptor for human receptors are derived following the EPUK methodology. The criteria used to define significance at the ecological sites identified are in line with guidance set out in the Environment Agency H1 guidance document¹², which in turn refers back to joint Environment Agency/Natural England guidance. With regard to ecology, in order to indicate area of the habitat that may be subject to significant effects the model included transects at increasing distances away from the roadside.

Table 9: Critical level assessment for the protection of vegetation

Receptor	NOx concentrations ($\mu\text{g}/\text{m}^3$)							
	2012 baseline	2017 without Proposed Scheme	2017 with Proposed Scheme	Change in concentrations ($\mu\text{g}/\text{m}^3$)	Critical level ($\mu\text{g}/\text{m}^3$) (annual mean)	Change in concentrations as % of critical level	Total NOx as a % of critical level	Potentially significant? ¹²
12-5 (10m)	29.5	21.2	25.0	3.7	30	12.4	83.3	Yes
12-5 (20m)	24.2	17.9	20.3	2.4	30	8.0	67.6	No
12-5 (50m)	19.2	14.7	15.8	1.1	30	3.7	52.6	No
12-5 (100m)	16.9	13.2	13.8	0.5	30	1.8	45.9	No
12-5 (150m)	16.2	12.7	13.1	0.3	30	1.1	43.5	No
12-5 (200m)	15.8	12.5	12.7	0.2	30	0.7	42.3	No

¹² Environment Agency, (2011), *H1 Annex F - Air Emissions* v2.2

Table 10: Critical load - nutrient nitrogen deposition

Receptor	Nitrogen deposition rate (kg N/ha/year)							
	2012 baseline deposition	2017 without Proposed Scheme	2017 with Proposed Scheme	Change in deposition (kg N/ha/year)	Critical load range (Kg N/ha/year)	Change in deposition as % of critical load	Total nitrogen deposition as a % of critical load	Potentially significant? ¹²
12-5 (10m)	43.4	44.7	45.3	0.5	5-15	10.8 (low) 3.6 (high)	905 (low) 302 (high)	Yes
12-5 (20m)	43.4	44.2	44.6	0.3	5-15	6.9 (low) 2.3 (high)	892 (low) 297 (high)	Yes
12-5 (50m)	43.4	43.8	43.9	0.2	5-15	3.2 (low) 1.1 (high)	879 (low) 293 (high)	Yes
12-5 (100m)	43.4	43.6	43.7	0.1	5-15	1.5 (low) 0.5 (high)	873 (low) 291 (high)	Yes
12-5 (150m)	43.4	43.5	43.6	0.0	5-15	0.9 (low) 0.3 (high)	871 (low) 290 (high)	No
12-5 (200m)	43.4	43.5	43.5	0.0	5-15	0.6 (low) 0.2 (high)	870 (low) 290 (high)	No

Assessment of significance

- 5.3.8 For sensitive human receptors identified next to roads meeting the DMRB criteria for assessment, the overall magnitude of impact is slight adverse at worst for NO₂ and negligible for PM₁₀ during the construction phase. Pollutant concentrations remain within the air quality standards for NO₂ and PM₁₀ with and without the proposed scheme.
- 5.3.9 The changes in air quality at worst case human receptors during the construction phase will not be a significant effect on receptors, because the adverse impact is negligible or slight taking into account background air quality and air quality standards.
- 5.3.10 In certain circumstances a qualitative assessment has been undertaken. This was the case for the A41 (between Bicester and Grendon Underwood), and the A41 between Bicester and the M40 Junction 9, which were identified as meeting the criteria for assessment due to an increase in traffic during construction. This qualitative assessment concluded that the magnitude of impact is expected to be small at worst for NO₂ and imperceptible for PM₁₀, on the basis of the distance to the receptor from the roads, the existing traffic flows on the construction routes and the fact that baseline air quality is well within air quality standards. The effect on air quality due to construction traffic will not be significant.
- 5.3.11 With regard to sensitive ecological habitats, the DMRB assessment found that impacts on Long Herdon Meadow SSSI were less than 1% of relevant criteria. Effects resulting from NO_x concentrations and N deposition will not be significant. A potentially significant effect was predicted for parts of the Ham Home-cum-Hamgreen Woods SSSI adjacent to the A41 (west of Blackgrove Road) for total NO_x and nitrogen deposition.
- 5.3.12 Following a more detailed assessment for the Ham-cum-Hamgreen Woods SSSI using ADMS roads, it was found that changes to air quality will have a potentially significant effect for nitrogen deposition on those parts of the receptor up to 100m from the A41 (west of Blackgrove Road). Potentially significant effects from increased concentrations of NO_x were confined to within 10m of the A41 road, taking into account the low background concentrations of NO_x.
- 5.3.13 It is highly unlikely that the increase in nitrogen deposition rate will have a measureable effect on the plant communities within the SSSI and the integrity of the feature, largely because the limited duration of the increase and the fact that it affects only a very small part of the SSSI. It will not, therefore, be a significant effect.

5.4 Operational traffic model

- 5.4.1 Operational traffic data used in this assessment are detailed in Volume 5: Appendix TR-001-000. Scenarios assessed were based on maximum traffic on affected roads during the operational phase of the Proposed Scheme.

Receptors assessed

For all road links where DMRB criteria for local air quality were met, a number of receptors representative of worst-case exposure locations were selected for assessment. These included locations representative of highest pollutant concentrations along the roads, including closest to junctions or to the road itself. All roads within the study area were identified and assessed as a result of permanent road-realignment. Receptors assessed are presented in Map AQ-01-012 (Volume 5, Air Quality Map Book).

Table 11: Modelled receptors (operational phase)

Receptor	Description/Location	Ordnance Survey coordinates
12-7	145 Station Road, assessed due to establishment of Station Road overbridge.	474004, 219185
12-8	Wayside Farm, assessed due to establishment of Blackgrove Road overbridge.	475795, 216929
12-9	Woodlands Farm Cottages, assessed due to the realignment of Edgcott Road	471589, 221000

Background concentrations

Table 12: Background 2026 concentrations at assessed receptors

Receptor (or zone of receptors)	Concentrations ($\mu\text{g}/\text{m}^3$)		
	NO _x	NO ₂	PM ₁₀
12-7 145 Station Road	8.5	6.2	13.0
12-8 Wayside Farm	9.0	6.6	14.4
12-9 Woodlands Farm Cottages	8.2	6.1	13.4

Design Manual for Roads and Bridges model results

5.4.2 This section provides the summary of the modelled pollutant concentrations for the assessed receptors using the DMRB methodology. The magnitude of change and impact descriptor are derived following the EPUK methodology⁷.

Table 13: Summary of DMRB annual mean NO₂ results (operational phase)

Receptor	Concentrations (µg/m ³)		Change in concentrations (µg/m ³)	Magnitude of change	Impact descriptor
	2026 without Proposed Scheme	2026 with Proposed Scheme			
12-7	6.9	6.6	-0.3	Imperceptible decrease	Negligible
12-8	7.7	6.9	-0.8	Small decrease	Negligible
12-9	6.4	6.3	-0.1	Imperceptible decrease	Negligible

Table 14: Summary of DMRB annual mean PM₁₀ results (operational phase)

Receptor	Concentrations (µg/m ³)		Change in concentrations (µg/m ³)	Magnitude of change	Impact descriptor
	2026 without Proposed Scheme	2026 with Proposed Scheme			
12-7	13.1	13.1	-0.1	Imperceptible decrease	Negligible
12-8	14.7	14.5	-0.2	Imperceptible decrease	Negligible
12-9	13.4	13.4	<-0.1	Imperceptible decrease	Negligible

Assessment of significance

- 5.4.3 The overall magnitude of impact is negligible for both NO₂ and PM₁₀ during the operation of the Proposed Scheme. Pollutant concentrations will remain well within air quality standards with and without the Proposed Scheme. AQMAs lie outside the study area.
- 5.4.4 The changes in air quality at worst-case receptors during the construction phase will not cause significant effects since the beneficial impact is negligible, taking into account background air quality and air quality standards.

6 References

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